

10% Phosphorus Removal In the Critical Area



What is the 10% Rule?

- Requires post-development water quality to be 10% better than it was prior to development or redevelopment
- Quantified as a 10% reduction in Phosphorus
- Separate requirement from MDE ESD
- Required for projects with 250 square feet of disturbance or more*
 - Private re/development projects: IDA only
 - State re/development projects: All designations

The Old Way

- 10% Worksheet (paper) was created with structural practices in mind.
- Does not provide accurate efficiencies for small ESD practices.



The Current Way

- 10% Spreadsheet (Excel), available for download on our website, replaces paper worksheet
- Enables designers to find most cost-effective combination of ESD practices that comply with ESD and CAC 10% requirement
- Adjusts effectiveness of ESD practices, based on individual BMP specs



Download Spreadsheet

Maryland.gov Phone Directory State Agencies Online Services Translate

DEPARTMENT OF NATURAL RESOURCES

Enter search term

CAC HOME COMMISSION INFO MAPPING REGULATIONS FAQ'S CONTACT US

Critical Area Commission

- General Information
- Development
- Buffer
- Stormwater Management**
- Shore Erosion Control
- Forms
- Local Government Materials
- Compliance Contacts
- Commission Agenda
- NEW! State Consultant Training - Information & Registration

Stormwater Resources

- Draft Stormwater Guidance Manual
- Draft ESD Spreadsheet**
- Environmental Site Design in the Critical Area
- Environmental Site Design Criteria for the Maryland Critical Area Webcast

Stormwater Management and Improving Water Quality in the Critical Area

One of the goals of Maryland's Critical Area Program is to minimize adverse impacts on water quality that result from pollutants that are discharged from structures and drainageways or that have run off from surrounding lands. To accomplish this goal, the Critical Area regulations include standards for managing and treating stormwater. Improving water quality by removing pollutants is particularly important in heavily developed areas cities and towns, where there are lots of buildings and impervious surfaces such as roads, parking lots, and sidewalks.



In order to effectively implement the Critical Area Program, most jurisdictions use three land use classifications that are defined in the regulations. All land, except federal land, is designated as one of following classifications, which, in most jurisdictions function as overlay zones:

1. Resource Conservation Areas (RCA)
2. Limited Development Areas (LDA), and
3. Intensely Developed Areas (IDA).

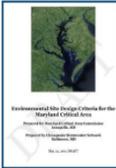
Most moderately and heavily developed areas are classified as Intensely Developed Areas (IDAs). Urban areas such as Annapolis and Baltimore City include significant land area designated IDA; however, some municipalities such as Leonardtown, Chestertown, and Princess Anne also include IDA lands. Generally IDAs are areas that are developed with residential, commercial, industrial, and institutional land uses where relatively little natural habitat occurred. IDAs are also considered the preferred locations for future growth through redevelopment and/or new development.

In order to meet the water quality goals of the Critical Area Program, the regulations require that any development or redevelopment within the IDA include practices to reduce water quality impacts associated with stormwater runoff. The regulations further specify that these practices must be capable of reducing stormwater pollutant loads from a development site to a level below that generated by the same site prior to development. These regulations have been in place since the effective date of the Critical Area Program in 1985 and pre-date current stormwater management regulations, implemented by the Maryland Department of the Environment (MDE). These regulations and the guidance manual used to implement them are commonly referred to as "The 10% Rule," referring to the required minimum reduction in stormwater

measure while the Critical Area design standards analyze the reduction of phosphorus, a common pollutant found in stormwater. In order to integrate compliance with both Critical Area and MDE standards, the requirements for both programs have been combined in a single spreadsheet compliance tool. In addition, this integrated methodology reflects improvements in the science of stormwater treatment and the engineering of treatment strategies and practices.

Draft Stormwater Guidance Manual

Commission staff, working with the Chesapeake Stormwater Network, has developed a draft stormwater guidance manual, entitled Environmental Site Design for the Maryland Critical Area. The manual provides an overview of stormwater treatment in the Critical Area and how ESD standards have been integrated into the design of stormwater management plans. It also includes step-by-step instructions for using the Stormwater Spreadsheet Tool, guidance for optimizing pollutant removal in the Critical Area, and Frequently Asked Questions (FAQs) about compliance with the pollutant reduction requirement in the Critical Area.



Draft ESD Spreadsheet

Commission staff has developed a Critical Area Stormwater Spreadsheet Tool to allow designers, engineers, and local plan reviewers to evaluate compliance with the new ESD regulations and pollutant removal performance standard. Version 4.0 of the spreadsheet, released in January 2014, enables the user to track 10% phosphorus reductions and ESD volume reductions for new development and redevelopment projects, both inside and outside the Critical Area. The spreadsheet provides, for the first time, a unified basis for addressing both the MDE and Critical Area regulations in a single tool. This tool should help streamline project review and reduce the need for duplicate submittals.

Please note that this spreadsheet is currently in DRAFT form. Furthermore, while the draft spreadsheet currently calculates 10% phosphorus requirements, Commission staff is testing and refining the spreadsheet to evaluate a potential change in phosphorus reduction calculations to match MDE's update to stormwater management requirements. Commission staff will provide updates if and when any such changes are proposed.

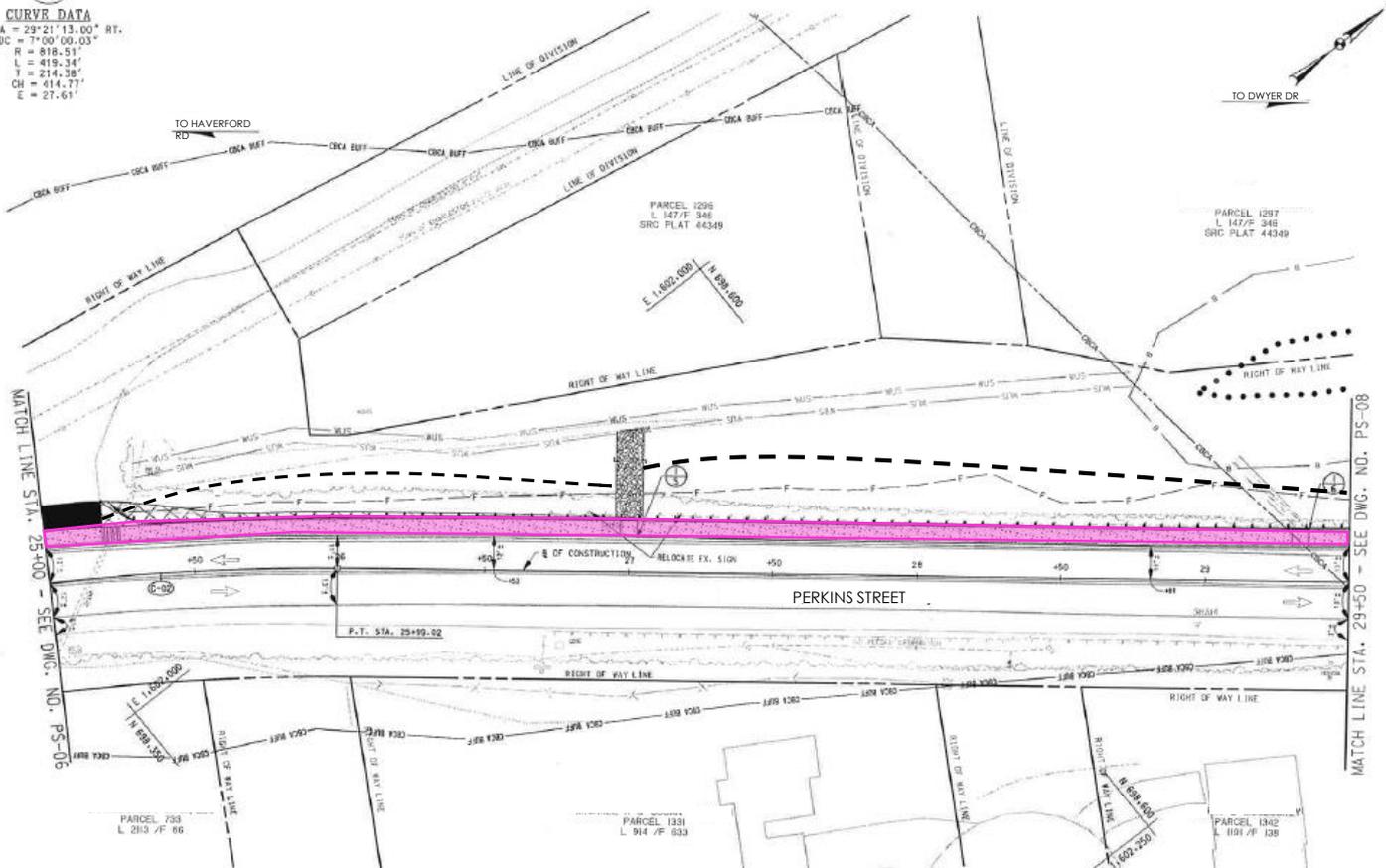
Commission staff is seeking feedback on its accuracy and ease of use of the spreadsheet. We are requesting designers, engineers, and plan reviewers to test this spreadsheet over the coming months and to send feedback to Nick Kelly (Nick.Kelly@maryland.gov).

Additional information on how to apply the ESD guidelines within the Critical Area, including a step-by-step guide on how to use the new spreadsheet, can be found within the [Critical Area ESD webinar](#), hosted by the Chesapeake Stormwater Network.

<http://dnr.maryland.gov/criticalarea/Pages/stormwater.aspx>

Example with Spreadsheet

CURVE DATA
 DELTA = 29°21'13.00" RT.
 DC = 71°00'00.03"
 R = 818.51'
 L = 819.34'
 T = 214.38'
 CH = 414.77'
 E = 27.61'



MATCH LINE STA. 25+00 - SEE DWG. NO. PS-05

MATCH LINE STA. 29+50 - SEE DWG. NO. PS-08

**LI'L SEBASTIAN SIDEWALK
 EXPANSION**
 PERKINS STREET, PAWNEE, INDIANA
 SIDEWALK RETROFIT PLAN

LEGEND

	FULL DEPTH IN-PLACE PAVING		12"		10"		CONSTRUCTION
	GRINDING & MILLING RESURFACING		PPE		INLET		STORM DRAIN
	CONCRETE SIDEWALK		SECTION MARKER		END WALL		BIO-SWALE
	PAVEMENT REMOVAL		MICROBIORETENTIO				

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*Li'l Sebastian
 Memorial*

ROADWAY PLAN

DATE: 05/20/2014 TIME: 1:06:05 PM CONTRACT NO.: 2013-017
 DESIGNED BY: B.A.E. COUNTY: COOK
 DRAWN BY: B.A.E. COUNTY: COOK
 CHECKED BY: W.M.L. COUNTY: COOK
 APP. NO.: 001-001-0001
 DRAWING NO.: PS-07 OF 10 SHEET NO.: 07 OF 10

CROSS REFERENCE

ITEM	SHEET NO.
TYPICAL SHEETS	10-48 TO 10-49
STANDARD SHEETS	10-48
PIPE & FINISH SCHEDULE	10-81
ROADWAY LAYOUT SHEETS	10-08 TO 10-02
ROADWAY PLAN SHEETS	10-09 TO 10-10
ROADWAY PROFILE SHEETS	10-11 TO 10-12
HYDROLOGICAL SHEETS	10-13
PROFILES & ELEVATION CONTROL	10-48 TO 10-49
BRIDGES & MAPPING PLANS	10-48 TO 10-49
LANDSCAPE PLAN SHEETS	10-48 TO 10-49

NOTES AND REVISIONS

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How the Spreadsheet Works

- Blue cells = inputs
- Gray cells = formulas (DO NOT TOUCH)
- Individual tabs for each BMP
- Summary Tab for Quick Check



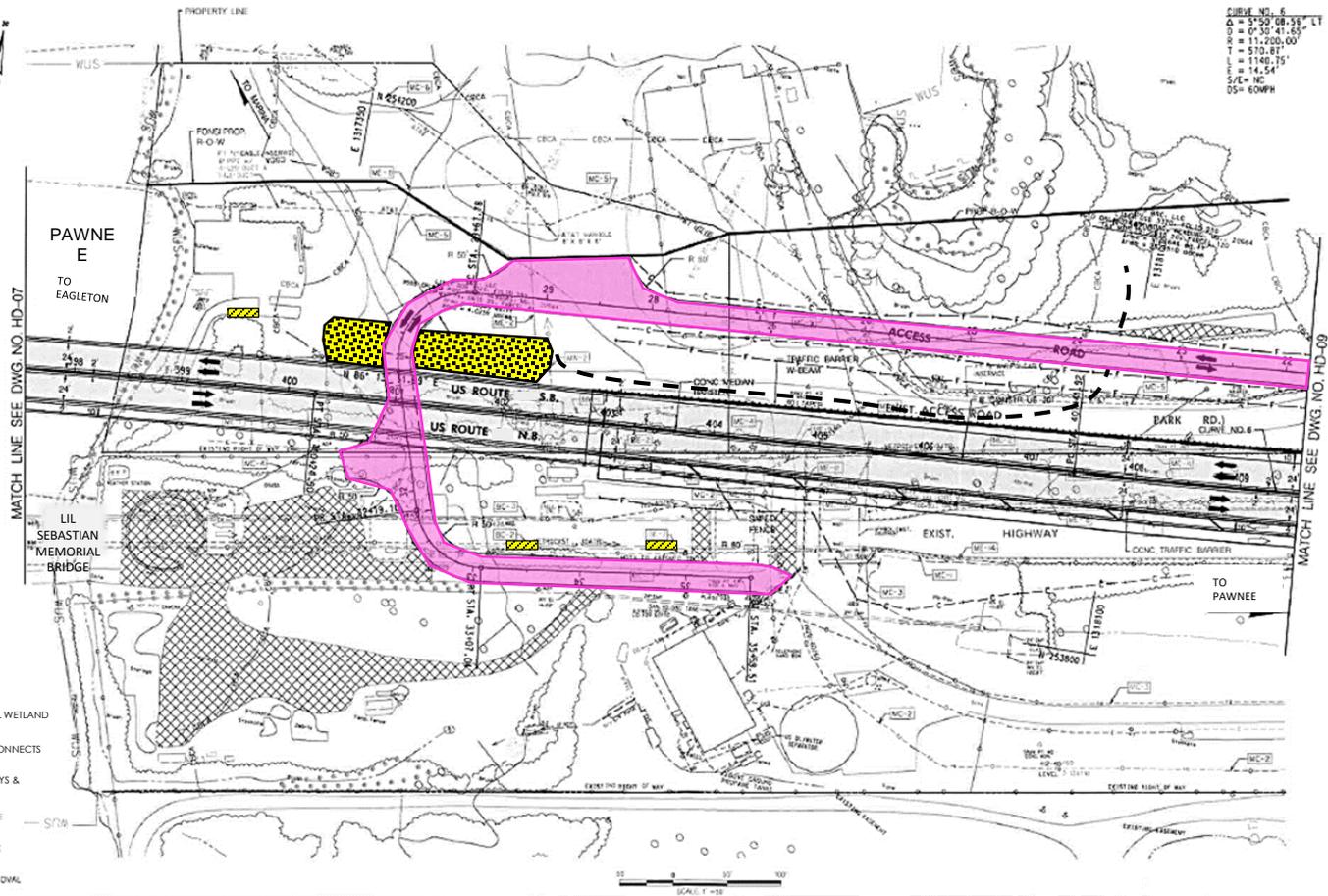
How the Spreadsheet Works

- Efficiencies vary from 20% - 80%
- One tab for each BMP
 - Allows for multiples of the same BMP
- Input of BMP-specific parameters (surface area, ponding depth, media depth, etc.)





CURVE NO. 6
 $\Delta = 57.50$ (88.38) LT
 $SI = 0.30$ (41.45) FT
 $R = 11,200.00$
 $T = 570.67$
 $L = 1140.33$
 $E = 14.54$
 $S/E = NC$
 $OS = 60MPH$



LEGEND

- WET SWALE
- SUBMERGED GRAVEL WETLAND
- NON-ROOFTOP DISCONNECTS
- PROPOSED ROADWAYS & SIDEWALKS
- GRIND PAVEMENT & LEVEL AS REQUIRED RESURFACE EXISTING PAVEMENT
- CONCRETE BRIDGE DOCK
- EXISTING PAVEMENT REMOVAL

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PRELIMINARY SUBMITTAL NOT FOR CONSTRUCTION

INDIANA TRANSPORTATION AUTHORITY

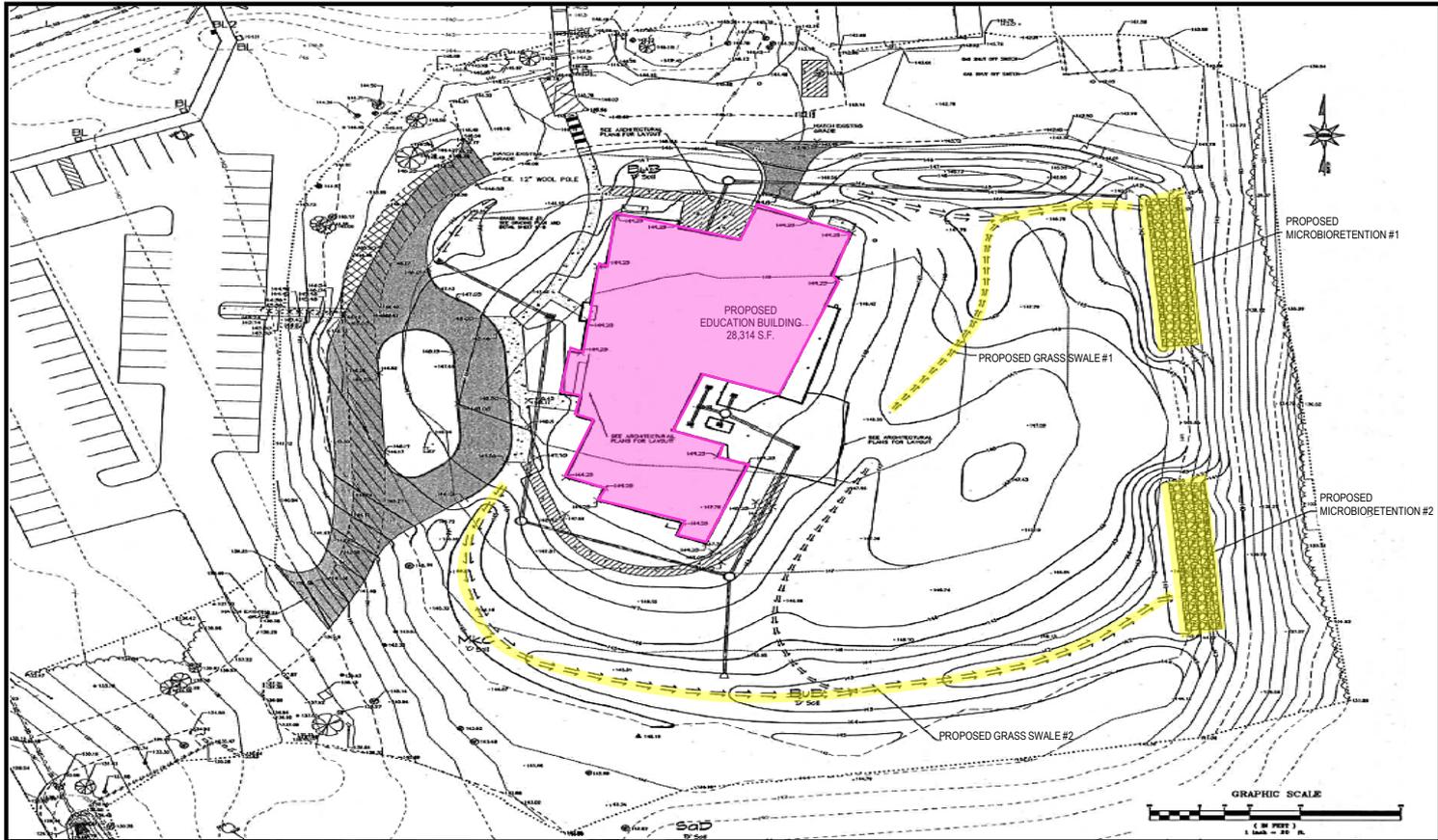
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

KNOPE-WYATT BRIDGE
 REPLACEMENT & REDEVELOPMENT
 PAWNEE, INDIANA TO EAGLETON, INDIANA

DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____
 CONST. REVIEW BY: _____ DATE: SEPTEMBER, 2017 SEAL: AS SHOWN

CONTRACT NO. NB-XXXX-XXXX-XXXX
 DRAWING NO. **HD-08**
 SHEET NO. 15 OF 29





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